The Researcher's Perspective on Procuring Public Works Projects

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Abstract

Purpose

As part of a comprehensive research study looking at implementing PPPs, interviews with experienced researchers were conducted to realize their views on private sector involvement in public works projects.

Design / methodology / approach

Amongst these interviews, five were launched with academics from Hong Kong and Australia, and two were conducted with Legislative Councillors of the Hong Kong Special Administration Region (HKSAR) government.

Findings

The interview findings show that both Hong Kong and Australian interviewees had previously conducted some kind of research in the field of PPP. The interviewees highlighted that "Different risk profiles" and "Private sector more innovative / efficient" were the main differences between projects that were procured by PPP and traditionally. Other differences include risk transfer. In a PPP arrangement the public sector passes on a substantial amount of the project risks to the private sector, whereas in a traditional case the public sector would take the largest responsibility in bearing these risks. Another common feature of the private sector is that they tend to be more efficient and innovative when compared to the public sector hence their expertise is often reflected in PPP projects. The interviewees agreed that the key performance indicators for PPP projects were unique depending on the individual project. The critical success factors mentioned

by both groups of interviewees included “Transparent process”, “Project dependent” and “Market need”. Due to the fact that PPP projects tend to be large scaled costly projects, adequate transparency in the process is necessary in order to demonstrate that a fair selection and tendering process is conducted. A market need for the project is also important to ensure that the project will be financially secure and that the private sector can make a reasonable profit to cover their project expenditure.

Originality / value

The findings from this study have enabled a comparative analysis between the views of researchers in two completely different jurisdictions. With the growing popularity to implement PPP projects, it is believed that the results presented in this paper would be of interest to the industry at large.

Keywords: Public Private Partnerships (PPP), Procurement, Interviews, Hong Kong, Australia.

1. Introduction

Public Private Partnership (PPP) projects can be dated as far back as the 1600s (Grimsey and Lewis, 2004). Early types of public infrastructure projects that involved the private sector include the turnpikes built in the United Kingdom and The United States, and also the water facilities that the French delivered through the concession approach. It was only until the introduction of Private Finance Initiative (PFI) during the nineties in the United Kingdom, that the approach became recognized worldwide as an effective way of

delivering value for money public infrastructure and services. PPP projects now account for about 15 and 8 percent of infrastructure spend in the United Kingdom and Australia respectively (Ernst and Young, 2005). On the other hand, PPP also plays a significant role in the infrastructure development of developing countries. Figure 1 presents the annual private investment between 1990 and 2006 in the public services of developing countries (World Bank, 2008).

Insert FIGURE 1 here.

The PPP approach has delivered both successful and less successful projects. The Cross Harbour Tunnel (CHT) in Hong Kong is an example of a highly successful PPP project in the form of Build Operate and Transfer. The two lane tunnel (in each direction) took only 36 months to complete and was eleven months ahead of schedule (Mak and Mo, 2005). The CHT was an instant success when it came in operation in August 1972. It was the first tunnel linking Hong Kong Island to Kowloon Peninsula. Before the tunnel was constructed traveling between the two places was by ferry for passengers and vehicles. There were more reasons for its success, it was well situated in the centre and provided the shortest route across the harbour of only 1,852 m. More importantly it was constructed at the right time. During the late sixties and seventies, Hong Kong's economy was developing at a high speed, and with good economy the number of vehicles on the street had also increased dramatically. Within three and a half years of operation the tunnel had already collected enough tolls to pay back for the construction cost. The franchise period for the project was thirty years the tunnel was therefore handed back to

the local Government on 31 August 1999. The tunnel is probably the most successful BOT project in Hong Kong. The tunnel is still one of the most important and profitable pieces of infrastructure locally.

The success of the CHT introduced around a dozen more BOT projects in Hong Kong. But not all these projects were equally as successful. A typical example is the Western Harbour Crossing (WHC) opened in 1993. This project was the third underwater roadway tunnel to connect Hong Kong Island with the Kowloon Peninsula. This project was constructed as part of a giant infrastructure improvement project reaching HK$160 billion in scale, centered on Hong Kong's new airport (Nishimatsu, 2006). Under the contract agreement of a 30 year period, the consortium can adjust the toll depending on the performance of the revenue. If the revenue is underestimated the toll can be increased to meet targets, on the other hand the toll can also be lowered if the toll exceeds the expected revenue. When the tunnel came into operation in April 1997 (Mak and Mo, 2005), Hong Kong was experiencing an economic downturn which in turn reduced the traffic volume. Another problem was that the WHC was very expensive to build. It cost approximately HK$7,500 million, which was over 23 times more than that for the CHT (Li, 2003). Therefore, in order to reach target revenue the WHC increased the toll causing drivers to use the other two cross harbour tunnels linking Hong Kong Island to Kowloon (Kwan, 2005). WHC can therefore be discussed as a less successful project. The project investors have not made their target revenue, the general public has a negative perception of the project due to some adverse media reporting and the local government has had to take up critique from the general public.

With the increasing popularity of adopting PPP projects around the world, research in this field has also become more important to both researchers and practitioners (Al-Sharif and Kaka, 2004). The Hong Kong Special Administrative Region (HKSAR) government has realised the benefits of using PPP in Hong Kong as well as the success achieved overseas. But a more thorough research is needed to develop the most suitable practice of PPP in terms of project nature, project complexity, project type and project scale under which PPP is most appropriate for Hong Kong. The lessons learnt from other countries are also useful. Hence this study has opted to consider the experience of PPP in Australia: one of the leading countries in implementing this model. The findings of this study are believed to be valuable to the government and construction industry at large. The opportunities for infrastructure development in Hong Kong will be broadened. In addition this project also forms a comparative study for the use of PPP in Australia and Hong Kong. This paper therefore sets out to address the following important issues:

a. Identify the benefits, difficulties and critical success factors of PPP.
b. Measure the effectiveness of PPP against other procurement methods.
c. Identify representative case studies from countries such as Australia for analysis to identify their approach to success/failure.
d. Identify previous projects in Hong Kong that utilized a similar approach to PPP and to analyze their implementation successfulness.
e. Investigate the best conditions in terms of project nature, project complexity, project types and project scales under which the use of PPP is the most appropriate.

2. Literature Review

2.1 What is the traditional practice of procuring public works project?

PPP projects are often compared with projects that are not procured by the PPP model i.e. traditional projects. But what exactly are traditional projects and how are they procured? Traditional projects unlike PPP projects do not involve the private sector in sharing the project risks. In traditional projects the public sector will undertake most risks. In a PPP arrangement the private sector will have to take up a certain proportion of the risks, often related to their duties i.e. construction, design, maintenance and operation. Whereas the public sector will take up some of the risks that are more difficult to control by the private sector alone such as environment and government approval risks. Another major difference, but not always, depending on the financial package of the project is that traditional projects are financed fully by the public sector whereas in a PPP project it is likely that the private consortium will have some equity in the asset being delivered. Again in a traditional arrangement the public sector undertakes the financial risk as well. For example in a toll road the public sector would need to undertake the revenue risk in a traditional project, whereas in a PPP project this risk would be undertaken most likely by the private sector. Therefore in general the main difference between a project procured traditionally and by PPP is the risk sharing matrix. Table 1 shows a general risk sharing matrix for the public and private sectors in PPP projects (Grimsey and Lewis, 2004). Many other studies have also been carried out in this area (Li et al., 2005; Sun et al., 2008;

Thomas et al., 2003; Wibowo and Kochendörfer, 2005; Thomas et al., 2006; Ng and Loosemore, 2007).

Insert TABLE 1 here.

2.2 Research Conducted in Public Private Partnerships

A comprehensive literature review of PPP research was previously conducted by the authors (Ke et al., 2008). A total of 148 recent publications from renowned journals were studied. The findings showed that the researchers from the United Kingdom were found to be the originators of most PPP papers, followed by the United States, Singapore, Hong Kong, China, Australia and Germany. It was assumed that construction education, national economics and mother language were all factors affecting which countries published more PPP papers. In academic institutions, Nanyang Technological University in Singapore, The University of Hong Kong, National University of Singapore, and Glasgow Caledonian University were all identified as active in pursuing PPP research. It was also found that various modes of PPP have been applied in different parts of the world, and the diverse concept of PPP has been publicly accepted instead of the more traditional Build Operate Transfer (BOT) scheme alone. PPP topics that were found to be of particular interest to the researchers included "Risk", "Procurement" and "Finance". In which seven more specific categories were derived from these topics including (a) Investment environment; (b) Procurement; (c) Economics viability; (d) Financial package; (e) Risk management; (f) Governance issue; and (g) Integration research. For the these

research studies, the techniques adopted vary from qualitative to quantitative analyses, some of which have included more vigorous techniques / theories in researching.

3. The Research Framework

The findings presented in this paper are part of an on-going research project looking at developing a best practice framework for implementing PPPs. As part of the data collection, interviews were conducted with PPP researchers in both Hong Kong and Australia.

3.1 Design of Interview Questions

Utilizing in-depth literature findings, five interview questions linking up to the project objectives were derived. Table 2 shows how these objectives are linked to the interview questions. In the first question the interviewees were asked "Have you conducted any research looking at local case studies?" This question aimed to collect information for objectives 3 – 6. Question 2 "How would you compare PPP with traditional procurement methods?" targeted to achieve objectives 2, 4 – 6. Objectives 5- 6 were covered again in Question 3 "Which type of project do you feel is best suited to use PPP?" and Question 4 "What do you feel are the key performance indicators in a PPP project?" In Question 5, interviewees were asked to answer "In general, what do you think are the critical success factors leading to successful PPP projects?" This question sought information for objectives 1, and 6.

Insert TABLE 2 here.

3.2 Selecting Respondents

The target respondents of the interviews were researchers with experience in PPP who neither belonged to nor acted for the public or private sectors. A total of seven interviews were conducted, with three in Hong Kong and four in Australia. Amongst the three interviewees from Hong Kong, two were members of the Legislative Council in Hong Kong (one with a law background and the other with an engineering background). The third interviewee was an academic and researcher in PPP from a local university. Similarly the Australian interviewees were all active researchers of the PPP topic from local universities. Due to the limited number of PPP projects conducted in Hong Kong (not including BOT type), fewer academics are involved with PPP related research, hence two legislative councilors were selected, both have been known to publicly mention their interests in PPP. As their role tends to represent the general public rather than the public or private sector, it was believed that their position would be similar to the academics interviewed. Background details of these experts are shown in Tables 3.

Insert TABLE 3 here.

4. A Comparison of the researcher's perspective in Hong Kong and Australia

Table 4 shows a summary of the responses to each question given by the seven interviewees. The number of times that each response was given was tallied. Where the response was only given once it was believed to be insignificant for further analysis. For the responses given more than once, these were tabulated and further analyzed.

Insert TABLE 4 here.

4.1 Research on local case studies

The first question that the interviewees were asked to answer was "Have you conducted any research looking at local case studies?" All interviewees responded that they had conducted PPP case studies and research both locally and overseas. In general, it can be summarized that the interviewees are active experienced researchers in the field of PPPs.

4.2 Comparing PPP with traditional procurement methods

The interviewees were further asked "How would you compare PPP with traditional procurement methods?" Thirteen different responses were given, but only four of these were mentioned more than once. These responses which were each mentioned twice included: "PPP is a partnership arrangement"; "PPPs have high tendering / transaction costs"; "Different risk profiles"; and "Private sector more innovative / efficient". Mentioned by the Hong Kong interviewees only was "PPP is a partnership arrangement" and "PPPs have high tendering / transaction costs". The Efficiency Unit of the HKSAR

government has been actively involved in pushing the movement of PPP in Hong Kong. In one of their latest guidelines they mention the importance of the partnership arrangement "A PPP is a contractual arrangement involving the private sector in the delivery of public services. As the name suggests, this is based on a partnership approach, where the responsibility for the delivery of services is shared between the public and private sectors, both of which bring their complementary skills to the enterprise" (Efficiency Unit, 2008). A common feature which is found in PPP projects is the high costs of tendering and transaction (Zhang, 2005). Hughes et al. (2001) reported that the costs associated with tendering are seen by the construction industry in the United Kingdom to be significant, typically quoted as ½ – 1% of turnover; and 2 – 3% of bid price for PPP bids. Furthermore results from their study showed that building services contractors had calculated that up to 15% of their turnover could be accounted for by "unnecessary" tendering processes. For the other two responses which were mentioned more than once ("Different risk profiles" and "Private sector more innovative / efficient"), these were mentioned by interviewees from both jurisdictions. As mentioned previously in this paper one of the main reasons for implementing public projects by PPP is also for risk transfer. The National Stadium for the Beijing 2008 Olympic Games in China is an example of how key risk factors were appropriately passed to the private sector via the PPP model (Liu et al., 2007). Without doubt this project has been highly profiled hence the pressure to perform well increased the risks associated. The four most critical risks of this project included 1) The irrational construction schedule for a project of this size and complexity; 2) Possible cost overruns due to inexperience in delivering similar previous projects in China; 3) Small and limited market for large scale sporting events in China;

and 4) Lack of operational experience in similar previous projects in China. These factors were all related to the management, design, construction and operation of the project, which are also aspects that are considered to be best handled by the private sector; whereas the public sector's expertise lies in the area of public administration. Another major difference observed between traditionally procured projects and PPP projects is the added innovation and efficiency from the private sector in PPP projects. The private sector in general tends to be more motivated due to financial drive, whereas the public sector parties are experts in policy making rather than innovation and efficiency. Studies have shown that by adopting PPP in public works projects, innovation and efficiency is achieved due to the private sector's contribution (Leiringer, 2006)

4.3 Projects best suited to use PPP

The interviewees were asked "Which type of project do you feel is best suited to use PPP?" in Question 3. Three out of the eight responses were mentioned twice by the interviewees, these included "Government lacks funding" and "Project dependent" which were mentioned by the Hong Kong interviewees and "Large projects" mentioned by the Australian interviewees. In many jurisdictions which first started to adopt PPPs, private financing was a major incentive for governments to adopt PPP, such as the United Kingdom and the Victoria state of Australia. Therefore there has been a common association that PPPs are about financing. An example, showing that Hong Kong does not need private sector financing can be shown by the recent Hong Kong Zhuhai Macau bridge where the governments of these three places have agreed to undertake the project

costs without private sector input. The Hong Kong government alone has agreed to cover approximately 50% of the costs, approximately HK$15.3 billion (South China Morning Post, 2008). The Hong Kong interviewees also mentioned that the suitability criteria of projects to be procured by PPP would be unique depending on the project. The Australian interviewees mentioned that large projects would be suitable for the PPP model. Similarly, Price (2002) suggested that for some types of projects, especially those that are large or complex, a joint venture between the public and private sectors may prove advantageous.

4.4 Key performance indicators in PPP projects

Only one response was mentioned more than once at twice by the interviewees for Question 4 "What do you feel are the key performance indicators in a PPP project?" This was "Project dependant" which was mentioned by interviewees from both jurisdictions. Six other responses were given by the interviewees for this question.

4.5 Critical success factors leading to successful PPP projects

For the final question, interviewees were asked "In general, what do you think are the critical success factors leading to successful PPP projects?" This question received the most number of responses probably indicating that there are many critical success factors that could lead to successful PPP projects. But amongst these responses only four were mentioned more than once by the interviewees, these included "Clear project objectives"

which was mentioned by the Hong Kong interviewees only and “Transparent process”, “Project dependent” and “Market need” which were all mentioned by interviewees from both jurisdictions. Zhang (2006) mentioned in his study that the public client often does not have clear objectives and priorities in infra- structure development through PPPs. This often impairs the project development process. The client should clearly define its objectives and establish their relative importance and make sure the private sector shares these objectives. The probability of successful project delivery increases dramatically when both sectors have a common vision of the project to be developed. In the Partnerships Victoria Policy (2000), it mentions that where there is private sector involvement in major public infrastructure projects, the choice of contractors should be through a rigorous and transparent system of public tendering. Similar to the responses for Questions 3 and 4, the interviewees also mentioned that the critical success factors for PPP projects would be dependent on the project due to their uniqueness. Lastly, Partnerships Victoria (2001) also mentioned that a key characteristic of Partnership Victoria projects (i.e. PPP projects in the Victoria state of Australia) includes market appetite. This implies that the project creates a genuine business opportunity which is likely to attract a sufficient number of private parties and create an effective and competitive bidding process.

5. Conclusion

This paper has presented the findings of seven interviews conducted by experienced researchers in the field of PPPs from Hong Kong and Australia. The interviewees were

asked to answer five questions related to the implementation of PPPs. It was found that both groups of interviewees had conducted case studies and research in the field of PPPs locally and internationally. When considering the differences between traditionally procured projects and PPP projects, both groups of interviewees agreed that "Different risk profiles" and "Private sector more innovative / efficient" were the main differences. Other major differences between the two approaches mentioned by the Hong Kong interviewees included "PPP is a partnership arrangement" and "PPPs have high tendering / transaction costs". The types of project best suited to use PPP were not the same according to the two groups of researchers. The Hong Kong interviewees recommended that "Government lacks funding" and "Project dependent" are suitable criteria for PPP projects, whereas, the Australian researchers believed that "Large projects" would be more ideal. Amongst the key performance indicators highlighted by the interviewees "Project dependant" was the only response given by both groups of interviewees. From the large number of critical success factors suggested "Transparent process", "Project dependent" and "Market need" were the common ones highlighted by both groups of interviewees. Hong Kong interviewees also believed that "Clear project objectives" would be an important critical success factor. The findings presented in this paper have summarized the views of renowned researchers from Hong Kong and Australia. These views are believed to be interesting to other researchers and practitioners who are actively involved with PPP projects. The findings also form a comparative study between the views of researchers in Hong Kong and Australia and draw similarities irrespective of the differences in jurisdictions.

6. The Overall Research Study

This paper forms part of a larger study which aimed to develop a best practice framework for implementing PPP in Hong Kong. Four standard methods were adopted, these included literature review; case study; interview; and questionnaire survey. The interviews were conducted with three main groups of experts: public sector, private sector and researchers. This paper reports those findings which were obtained from the researchers only. The findings from these interviews were further combined with the data collected from the other techniques in both Hong Kong and Australia. The research data and analyses were triangulated from multiple sources to help improve the credibility of the findings. And finally the results contributed to the development of a best practice framework for PPP projects in Hong Kong.

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Table 1 A general risk sharing matrix for the public and private sectors in PPP projects (Grimsey and Lewis, 2004)

Type of risk	Source of risk	Risk taken by
Site risks		
Site conditions	Ground conditions, supporting structures	Construction contractor
Site preparation	Site redemption, tenure, pollution/discharge, obtaining permits, community liaison	Operating company/project company
	Pre-existing liability	Government
Land use	Native title, cultural heritage	Government
Technical risks	Fault in tender specifications	Government
	Contractor design fault	Design contractor
Construction risks		
Cost overrun	Inefficient work practices and wastage of materials	Construction contractor
	Changes in law, delays in approval, etc.	Project company/investors
Delay in completion	Lack of coordination of contractors, Failure to obtain standard planning approvals	Construction contractor
	Insured force majeure events	Insurer
Failure to meet performance criteria	Quality shortfall/defects in construction/commissioning tests failure	Construction contractor/project company
Operating risks		
Operating cost overrun	Project company request or change in practice	Project company/investors
	Industrial relations, repairs occupational health and safety, maintenance, other costs	Operator
	Government change to output specifications	Government

Delays or interruption in operation	Operator fault	Operator
	Government delays in granting or renewing approvals providing contracted inputs	Government
Shortfall in service quality	Operator fault	Operator
	Project company fault	Project company/investors
Revenue risks		
Increase in input prices	Contractual violations by government-owned support network	Government
	Contractual violations by private supplier	Private supplier
	Other	Project company/investors
Changes in taxes, tariffs	Fall in revenue	Project company/investors
Demand for output	Decreased demand	Project company/investors
Financial risks		
Interest rates	Fluctuations with insufficient hedging	Project company/government
Inflation	Payments eroded by inflation	Project company/government
Force majeure risk	Floods, earthquakes, riots, strikes	Shared
Regulatory/political risks		
Changes in law	Construction period	Construction contractor
	Operating period	Project company, with government compensation as per contract
Political interference	Breach/cancellation of license	Government
	Expropriation	Insurer, project company/investor
	Failure to renew approvals discriminatory taxes, import restrictions	Government
Project default risks	Combination of risks	Equity investors followed by banks, bondholders and institutional lenders
	Sponsor suitability risk	Government

Asset risks	Technical obsolescence	Project company
	Termination	Project company/operator
	Residual transfer value	Government

Table 2 Project objectives linking up with interview questions

Question	Objective					
	1	2	3	4	5	6
	Identify the benefits, difficulties and critical success factors of PPP.	Measure the effectiveness of PPP against other procurement methods.	Identify representative case studies from countries such as Australia for analysis to identify their approach to success/failure.	Identify previous projects in Hong Kong that utilized a similar approach to PPP and to analyze their implementation successfulness.	Investigate the best conditions in terms of project nature, project complexity, project types and project scales under which the use of PPP is the most appropriate.	Evaluate the findings collected to determine a best practice framework for implementing PPP in Hong Kong.
1. Have you conducted any research looking at local case studies?			✓	✓	✓	✓
2. How would you compare PPP with traditional procurement methods?		✓		✓	✓	✓
3. Which type of project do you feel is best suited to use PPP?					✓	✓
4. What do you feel are the key performance indicators in a PPP project?					✓	✓
5. In general, what do you think are the critical success factors leading to successful PPP projects?	✓					✓

Table 3 List of Interviewees

No.	Jurisdiction	Position of Interviewee	Organization of Interviewee
R1	Hong Kong	Member of Legislative Council (Legal background)	Legislative Council of the HKSAR Government
R2	Hong Kong	Member of Legislative Council (Engineering background)	Legislative Council of the HKSAR Government
R3	Hong Kong	Professor	Local University
R4	Australia	Professor	Local University
R5	Australia	Professor	Local University
R6	Australia	Professor	Local University
R7	Australia	Professor	Local University

Table 4 Summary of Interview Findings with Researchers from Hong Kong and Australia

	Hong Kong Interviewees			Australian Interviewees				
	R1	**R2**	**R3**	**R4**	**R5**	**R6**	**R7**	**Total**
1. Have you conducted any research looking at local case studies?								
Yes	✓	✓	✓	✓	✓	✓	✓	**7**
2. How would you compare PPP with traditional procurement methods?								
Clear project objectives	✓							**1**
PPP utilizes public resources		✓						**1**
PPP is a partnership arrangement		✓	✓					**2**
PPPs have high tendering / transaction costs		✓	✓					**2**
PPP projects tend to be completed on-time			✓					**1**
Income of PPP projects can be dependent on market			✓					**1**
Construction costs of PPPs are more expensive			✓					**1**
PPPs consider maintenance			✓					**1**
Different risk profiles			✓		✓			**2**
More expensive for private sector to borrow money			✓					**1**
Private sector more innovative / efficient			✓	✓				**2**
PPPs focus on service delivery					✓			**1**
PPPs improve public procurement							✓	**1**
3. Which type of project do you feel is best suited to use PPP?								
Government lacks funding	✓		✓					**2**
Project dependent	✓	✓						**2**
Projects with few competitors			✓					**1**
Large projects				✓	✓			**2**
Expensive projects				✓				**1**
Quantifiable income stream				✓				**1**
Scope for innovation					✓			**1**

Toll ways							✓	**1**
4. What do you feel are the key performance indicators in a PPP project?								
Profits	✓							**1**
Project dependant			✓		✓			**2**
Traditional KPIs: Quality, time and cost			✓					**1**
Should be defined by private sector				✓				**1**
Service outcomes					✓			**1**
Contract compliance							✓	**1**
Proactive managers							✓	**1**
5. In general, what do you think are the critical success factors leading to successful PPP projects?								
Clear project objectives	✓	✓						**2**
Timeline and milestones foreseeable	✓							**1**
Transparent process		✓					✓	**2**
Public consultation		✓						**1**
Project dependent		✓			✓			**2**
Clear legal structure and regulation mechanism			✓					**1**
Market need			✓				✓	**2**
Technical and financial capability of concessionaire			✓					**1**
Champion with authority					✓			**1**
Roles clearly defined and related to each other							✓	**1**
Need to budget money for project amount							✓	**1**
Right timing							✓	**1**
Strong and robust contract							✓	**1**
Commitment of partners							✓	**1**

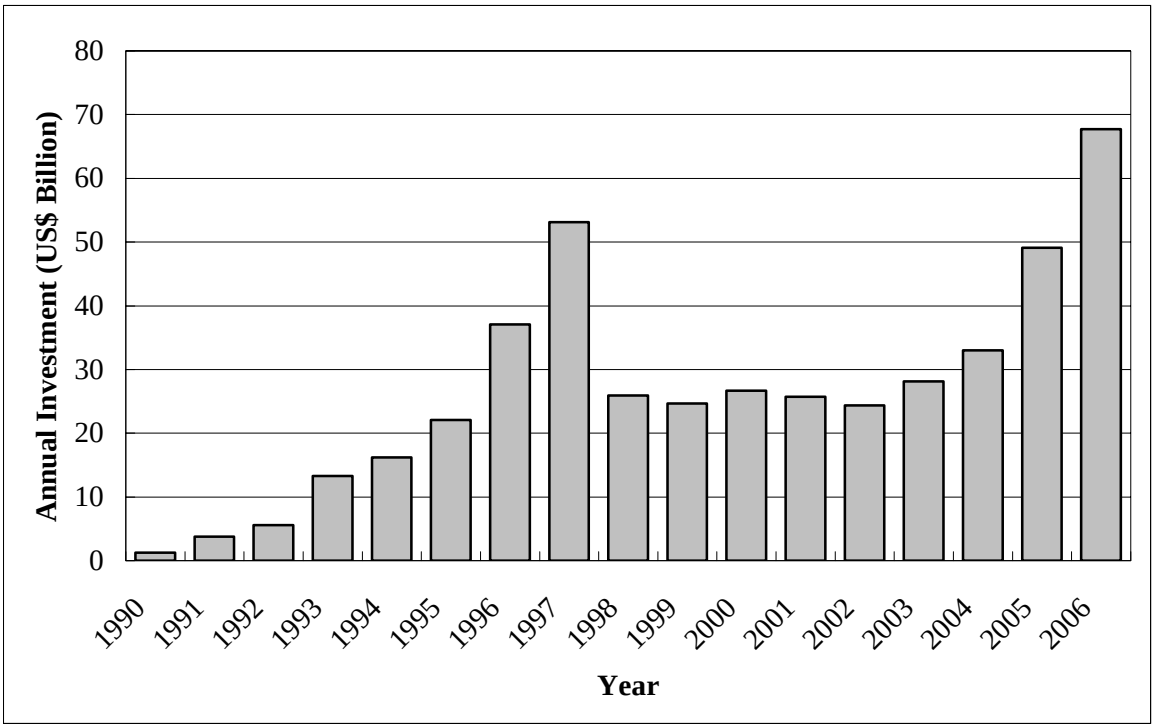

Figure 1 Annual investment of infrastructure projects with private participation in developing countries between 1990-2006 (World Bank, 2008)